JPRS: 3016

24 February 1960

MAIN FILE

THE "TEPLOKONTROL'" PLANT AND GOVERNMENT STANDARDS

USSR

Distributed by:

OFFICE OF TECHNICAL SERVICES
U.S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D.C.
(Price: $0.50)

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
205 EAST 42ND STREET, SUITE 300
NEW YORK 17, N.Y.

JPRS: 3016
CSO: 3374-D

THE "TEPLOKONTROL'" PLANT DOES NOT COMPLY WITH GOVERNMENT STANDARDS

(Letter to the Editor)

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Standartizatsiya
/Standardization/
No. 11, November 1959, Moscow
Pages 51-52
Russian, per.

Devices and regulators built by the "Teplokontrol'" Plant in Kazan, are used by many enterprises in various branches of industry for controlling and regulating production processes. For this reason, the staff and the administration of the plant must be able to manufacture devices of a high quality. However, the plant is constantly receiving protests and complaints from consumers concerning the quality of its products. Some devices break down after a short period of operation, while others fail to give stable readings and control even during transportation.

This is due to one basic reason: the "Teplokontrol'" Plant does not comply with government standards for equipment. A systematic control testing of equipment, specified in standards, is not performed at the plant.

Spot control tests of devices, taken from the warehouse of finished products showed that a significant portion of the equipment approved by the plant, OTK (Technical Control Department) and ready for shipment was not capable of operating.

Thus, for example, out of 10 DP-430 and DP-610 differential manometers and flow meters of the indicator and recording type, two did not maintain stable readings, and one of these two instruments did not operate at all. Out of 7 differential and flowmeters equipped with telemetric devices of the DEPS and DPEM types six did not operate because of a complete failure in regulation caused by the falling out of the balance beam unit from the blade supports in the secondary E-280 and E-610 devices, while one instrument exceeded by two times the established accuracy specifications for the flow scale. Out of the 7 differential manometer equipped with integrating devices, -- six differential manometers of the type DP-612 and DP-281 did not maintain prescribed accuracy specifications and some of them did not operate because of a defective assembly of the

integrating device and of the computer mechanism, and as a result of the poor quality of parts in the integrating device.

Half of the checked batch of thermometers, of the manometric self-recording TSG-410 and TSG-610 type, and of the small-size manometers with a measuring range of 250 and 300 kgs/sq.cm, did not maintain stable readings.

Some self-recording electrical manometers of the MUE type exceeded by two times the established accuracy specifications, and one instrument failed to operate.

Following a complete dismantling of the instruments and measurements of the principal parts, gross deviations of the dimensions from those stipulated in the blueprints were discovered. Thus, for example, the dimensions of most axles were reduced as a result of a crude adjustment by means of a file after polishing. The dimensions of the supports (prisms) and of the blades of telemetric differential manometers were 4 to 5 times greater than the dimensions specified in blueprints, which was one of the reasons for the falling out of the balance beam unit in the secondary device of these instruments and for their complete breakdown during testing.

Such important parts as the gage, lower and upper plates, coupling lever, etc. were also designed with a departure from the established dimensions. The assembly of the integrator unit was characterized by the presence of bends and manual adjustment of parts, thus causing an alterations of their original geometric shape.

Frequently, instruments give incorrect readings because of careless assembly (wearing out of hair springs, jamming of computing mechanisms catching of screws in the holder diagrams, poor compression of bushings, etc.).

The quality of differential manometers and flowmeters with integrating and telemetric devices is especially poor. As a rule, many enterprises which have received these instruments disconnect the integrators from the differential manometers because of their inefficiency, and the consumption of the measured medium is calculated by means of a laborious "planimetric" method, which results in excessive costs and a lower degree of accuracy. Very often the stability and adjustment of telemetric differential manometers and flowmeters are lost during transportation and after a short period of operation. Self-recording and registering manometric thermometers break down prematurely as a result of non-hermeti thermal systems and breaks (cracks) of capillaries, or as a result of inadequate protective braiding, etc. Small-size registering manometers

with a 60 mm case and a measuring range of over 100 kgs/sq.cm lose their accuracy characteristics already after several months because of stretching of sensitive elements (Bourdon tubes).

Many communications on the poor quality of instruments have been received at the plant and at the Tatar sovnarkhoz (Council of National Economy). However, the plant managers (Director G. I. Solov'yev, Chief Engineer V. V. Makhan'ko) and the administration of the Tatar sovnarkhoz are not taking any measures eliminate the existing deficiencies. They were concerned about the fact, that, for example, only during the first six months following government inspection, 19.5% of the differential meters, approved by the plant OTK were returned to the plant. During 1958, the plant received over 200 complaints concerning almost 3,000 instruments and during the first six months of 1959 -- 77 complaints about 564 instruments.

The technical control department (OTK) of the plant is mainly responsible for this situation. OTK workers put their stamp of approval on items known to be defective.

The Technical Control Department does not study the reasons responsible for the output of low quality items and does not carry out systematic control tests of the output parameters of the instruments and on whether they meet prescribed standards. According to its work schedule, the OTK together with the instrument laboratory, was to perform 8 control tests, but actually performed only 4 tests. In addition the control test program did not include methods for testing the dependability and operating stability of the instruments. Differential manometers were never tested for transportation jolting. Manometers are not subject to variable pressure tests, although appropriate equipment is available at the plant. Not a single instrument was dismantled, and instrument parts and units were not checked for conformity with blueprints and technical specifications.

One of the reasons for the production of low quality items is the severe infringement of technological discipline at the plant. Poor quality parts and units from machine shops are sent through to assembly shops, which in a number of cases resulted in a breakdown of parts and caused a complete disruption of the instruments adjustment, such as in differential manometers DPE, DPEM, DP-610 and DP-281).

Individual production sectors (assembly and control test shops) are not provided with the necessary number of inspectors. Many inspectors in instrument adjustment and assembly shops are insufficiently trained, and the technical training provided at the plant is not sufficient to increase their skill.

The workers of the plant did not reach the necessary conclusions from the directives issued at the June Plenum of the CPSU concerning the development of new technical processes and equipment. Some of the instruments built at the plant have already become obsolete, and their technical level does not correspond to the requirements of the national economy. Such instruments include, for example, mercury filled and float-equipped differential manometers DP-280, DP-281, DP-410, DP-430, DP-612 and DP-278, having an accuracy grade of 1.5 a measuring range of 40 to 1000 mm (mercury column) and a static pressure of up to 160 kgs/sq.cm. These instruments should have been improved a long time ago for example by replacing their complex integrating device, which has a poor operating performance, with an integrator equipped with a mechanical and electrical drive mechanism; by replacing the quadratic scale with a linear diagram; by protecting the instrument from the ejection of mercury during bilateral overload testing; by allowing the possible simultaneous recording of consumption and temperature pressure, with a temperature and pressure correction; by reducing the weight and dimensions of the instruments; and by raising their accuracy to class 1 and 0.5, and introducing other improvements.

Float equipped and mercury filled pneumatic differential, of the DP-280 type having an accuracy grade of 1.5 measuring range of 40 to 1,000 mm. mercury column, a static pressure from 160 kgs/sq.cm. and equipped with secondary of MS-type devices, are suitable only for the automation of individual parameters, and cannot be used in complex automation systems in view of their inadequate dynamic properties (high speed performance and sensitivity).

Serious defects are found in telemetric induction differential manometers of the DPES and DPEM types with equipped E-281, E-612, devices, having an accuracy grade of 2 and 2.5, operating on static pressures of 25, 160, and 320 kgs/sq.cm. with a measuring range of 40 mm. water column to 1,000 mm mercury column and a maximum recording transmission range of up to 300 meters. Their feeders and secondary units are not interchangeable; their integrating mechanisms have the same defects as the integrators of DP-281 and DP-612 differential manometers. The instruments do not have standardized input and output signals, and are not suitable for a complex automation system; their readings vary with variations in frequency voltage and the under the effect of the resistance of the line capacitance and cannot be used for distance measurements above 300 meters. The induction coil unit is not dependable under operating conditions at temperatures of up to 40°. Large amounts of copper (2.5 kilograms) are required for its manufacture.

The plant is still manufacturing manometric recording and registering thermometers of the TG-610, TG-410, TG-273 type. These instruments do not satisfy the requirements of GOST 8624-57 for measuring range and accuracy specifications their readings are not stable as a result of non-hermetic thermal systems, and are of large dimensions and heavy weight. At the same time the plant is not organizing the mass production of more efficient thermometers of the TPG-1, TPZH-1, TPR-1, TSZH, TSR and TSG type, experimental models of which have successfully undergone government tests. The serial production of these improved thermometers had been assigned to this plant.

The manufacture of new instruments at the plant is being organized slowly. Thus, for example, according to a plan approved by the Tatar sovnarkhoz, the plant was to organize the manufacture of 13 types of instruments whose experimental during the current year; experimental models of these instruments have passed government tests and their serial manufactur has been authorized (recording thermometers TSZH-710, TSZH-710 ch, TSR-710, TSG-710, TSG-710 ch, DSZP, DSZE, and DSPK-10 differential manometers of the bellows-sealed pneumatic and electrical compensation type, and MTP and MSG-type recording manometers. The plant's planned work schedule does not include the manufacture equipment of PPR-1 (instruments) (Petrov instruments) greatly needed by the national economy, and of the technical manometers according to GOST 8625-59, the serial production of which is to start in January 1960, of TPG-1, TPZH-1 and TPR-1, manometric thermometers experimental models of which were approved as far back as 1957 to replace the type TG-270, which was obsolete and the serial production of which was prohibited. Not one of the above instruments has been put into serial production, and only individual shops have been assigned the task of manufacturing individual instrument batches without having the proper equipment.

The blueprints and technical specifications for instruments built in series, which were turned over to the "Teplokontrol'" Plant as far back as 1954, have not been reviewed and approved by the Tatar sovnarkhoz, inspite of the fact that a number of standards have been revised during recent years, including GOST 7919-56 for recording manometers, GOST 8625-59 for "Manometers, Vacuum Manometers and General-Purpose Recording Vacuum Gages," GOST 86-24-57 "Manometric Thermometers", and others.

The "Teplokontrol'" Plant must improve the quality of its products stop the manufacture of obsolete instruments, and organize the production of new, and improved instruments needed by the national economy.

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